: Mohamed K. Diab, et al.

Filed

September 1, 1998

REMARKS

Claims 15-30 were previously pending. No claims have been canceled or amended.

Applicants note with appreciation the Examiner's indication that the application is in

condition for allowance except for his request to comply with the new interference rules.

Information Disclosure Statements

The Applicants submit herewith two Information Disclosure Statements (IDS) seeking

additional compliance with MPEP § 2001.06 identifying litigation related documents. One IDS

provides references potentially subject to a protective order in an now-settled litigation in related

patents, and the other IDS provides a copy of a Federal Circuit decision based that litigation.

While the Applicants do not believe that these references will affect the patentability of the

pending claims, the Applicants respectfully request the consideration of the same.

Interference Issues

A Request for Interference was filed in this case on September 1, 1998. Since that date,

the rules regarding interference practice were amended. The present Office Action requests

compliance with the rules propagated after the September 1, 1998 filing. Accordingly,

Applicants herewith resubmit the request to have an interference declared between this

application and an unexpired patent. Pursuant to 37 CFR § 41.202, Applicants submit the

following information.

(1) Identification of the Patent -- 37 CFR § 41.202(a)(1)

Applicants seek an interference with U.S. Patent No. 5,662,105 (the '105 patent), which

issued on September 2, 1997 to Jonathon Tien. The '105 patent is entitled SYSTEM AND

METHOD FOR THE EXTRACTION OF PHYSIOLOGICAL SIGNALS, and at issuance was

assigned to SpaceLabs Medical, Inc., of Redmond, WA.

-8-

:

Mohamed K. Diab, et al.

Filed

September 1, 1998

(2) Presentation of the Proposed Counts -- 37 CFR § 41.202(a)(2)

Claims 1-7, 10-14, 17 and 18 of the '105 patent are believed to interfere with Claims 15-

19, 22-25, 27 and 28 of the present application. Proposed Count 1, presented below, corresponds

to these claims.

Claims 8, 9, 15, 16, 19 and 20 of the '105 patent are believed to interfere with Claims 20,

21, 26, 29 and 30 of the present application. Proposed Count 2, also presented below,

corresponds to these claims.

Count 1

A system for the enhancement of physiological signals for the measurement of blood

oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and

second light sources producing first and second light signals of first and second

wavelengths, respectively;

a light detector positioned to detect said first and second light signals after

interaction with the subject and to generate first and second signals indicative of an

intensity of said first and second detected light signals, respectively, said first generated

signal having a first portion arising from light transmitted from said first source and a

second portion arising from a first interference source; said second generated signal

having a first portion arising from light transmitted from said second source and a second

portion arising from a second interference source;

an adaptive signal processor having a signal input coupled to said light detector to

receive said first generated signal, an adaptive filter having an input to receive a reference

signal, and an output, and an error output to generate an error signal, wherein said error

-9-

: Mohamed K. Diab, et al.

Filed

September 1, 1998

output is coupled to said adaptive filter to adjust said adaptive filter so that a function of

said error signal has a minimum;

wherein said first and second portions of said first and second generated signals

and a first ratio constant have a defined mathematical relationship;

a reference signal generator to generate said reference signal based on a possible

value of said first ratio constant; and

a peak detector to receive an output signal from said adaptive signal processor and

determine a calculated value for said first ratio constant corresponding to a first peak

value of said output signal over a predetermined range of possible ratios, said reference

signal generator generating said first portion of said first detected signal and said first

portion of said second detected signal based on said mathematical relationship and said

calculated value of said first ratio constant.

Count 2

A system for the enhancement of physiological signals for the measurement of blood

oxygen in a subject, the system comprising:

first and second light sources to direct light toward the subject, said first and

second light sources producing first and second light signals of first and second

wavelengths, respectively;

a light detector positioned to detect said first and second light signals after

interaction with the subject and to generate first and second signals indicative of an

intensity of said first and second detected light signals, respectively, said first generated

signal having a first portion arising from light transmitted from said first source and a

-10-

Applicants : Mohamed K. Diab, et al.

Filed : September 1, 1998

second portion arising from a first interference source; said second generated signal

having a first portion arising from light transmitted from said second source and a second

portion arising from a second interference source;

an adaptive signal processor having a signal input coupled to said light detector to

receive said first generated signal, an adaptive filter having an input to receive a reference

signal, and an output, and an error output to generate an error signal, wherein said error

output is coupled to said adaptive filter to adjust said adaptive filter so that a function of

said error signal has a minimum;

wherein said first and second portions of said first and second generated signals

and a first ratio constant have a mathematical relationship derived from the following

model:

 $S_{red} = s_1 + n_1$

 $S_{IR} = s_2 + n_2$

 $s_1 = r_a s_2$

 $n_1 = r_v n_2$

where S_{red} corresponds to said first generated signal, s₁ corresponds to said first portion of said

first generated signal, n₁ corresponds to said second portion of said first generated signal, S_{IR}

corresponds to said second generated signal, s2 corresponds to said first portion of said second

generated signal, n₂ corresponds to said second portion of said second generated signal, r_a is said

first ratio constant and corresponds to a ratio of said first portion of said first generated signal to

said first portion of said second generated signal, and r_v is a second ratio constant and

corresponds to a ratio of said second portion of said first generated signal to said second portion

of said second generated signal;

-11-

Mohamed K. Diab, et al.

Filed

: September 1, 1998

a reference signal generator to generate said reference signal based on a possible value of said first ratio constant; and .

a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said first ratio constant.

(3) Explanation of Why the Claims Interfere -- 37 CFR § 41.202(a)(3)

The following claim charts compare the claims of the present application with the claims of the '105 patent. The claim chart also shows why the claims interfere within the meaning of 37 CFR § 41.203(a).

COMPARISON OF PENDING CLAIMS 15 - 30 WITH THE '105 PATENT CLAIMS

Pending Claim 15	Tien Claim 1	Reason for Interference
A system for the enhancement	A system for the enhancement	The preamble recitation of
of physiological signals for	of physiological signals for	each of pending Claim 15
the measurement of blood	the measurement of blood	and '105 patent Claim 1 is
oxygen in a subject, the	oxygen in a subject, the	identical. Applicants take
system comprising:	system comprising:	no position as to whether
		this portion of the claims
		constitutes a limitation. To
·		the extent the preamble
		recitation constitutes a
		limitation, each claim
		would anticipate the other
		as to the preamble
		recitation.
first and second light sources	first and second light sources	Pending Claim 15 and '105
to direct light toward the	to direct light toward the	patent Claim 1 would each
subject, said first and second	subject, said first and second	anticipate the other as to
light sources producing first	light sources producing first	this limitation.
and second light signals of	and second light signals of	

Mohamed K. Diab, et al.

Filed

September 1, 1998

first and second wavelengths, first and second wavelengths, respectively; respectively; a light detector positioned to a light detector positioned to Pending Claim 15 and '105 detect said first and second patent Claim 1 would each detect said first and second light signals after interaction light signals after interaction anticipate render or obvious the other as to this with the subject and to with the subject and to generate first and second generate first and second limitation. signals indicative of signals indicative of intensity of said first and intensity of said first and second detected light signals, second detected light signals, respectively. said first respectively, said generated signal having a first generated signal having a first portion arising from light portion arising from light transmitted from said first transmitted from said first source and a second portion source and a second portion arising from arising from a first a interference interference light source; said source: said signal generated second signal second generated having a first portion arising having a first portion arising from light transmitted from from light transmitted from said second source and a said second source and a second portion arising from a second portion arising from a second interference source; second interference light source: Pending Claim 15 and '105 an adaptive signal processor an adaptive signal processor having a signal input coupled having a signal input coupled patent Claim 1 would each anticipate render to said light detector to to said light detector to or receive said first generated receive said first generated obvious the other as to this signal, an adaptive filter signal, an adaptive filter limitation. having an input to receive a having an input to receive a reference signal, and reference signal, and output, and an error output to output, and an error output to generate an error signal, generate an error signal, wherein said error output is wherein said error output is coupled to said adaptive filter coupled to said adaptive filter to adjust said adaptive filter to adjust said adaptive filter so that a function of said error so said error signal has a minimum value; signal has a minimum; a storage location containing a Pending Claim 15 and '105 wherein said first and second mathematical relationship of patent Claim 1 would each portions of said first and said first and second portions anticipate second generated signals and or obvious the other as to this a first ratio constant have a of said first and second generated signals and a first defined mathematical limitation. ratio constant; relationship; a reference signal generator to Pending Claim 15 and '105 a reference signal generator to

Mohamed K. Diab, et al.

September 1, 1998

generate said reference signal	
based on a possible value of	•
said first ratio constant; and	

generate said reference signal based on an estimated value of said first ratio constant; and

patent Claim 1 would each anticipate render or obvious the other as to this limitation.

a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said first ratio constant.

a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value of said first ratio constant.

Pending Claim 15 and '105 patent Claim 1 would each render anticipate or obvious the other as to this limitation.

Pending Claim16

The system of Claim 15 wherein said output signal received by said peak detector is selected from a set of signals comprising output approximations to said first and second signal portions of said first and second signals, wherein said error output and said adaptive filter output generate output signals of said set.

Tien Claim 3

The system of Claim 1 wherein said output signal received by said peak detector is selected from a set of output signals comprising said error signal output and said adaptive filter output.

Reason for Interference Pending Claim 16 and '105 patent Claim 3 would each anticipate or render obvious the other.

Pending Claim 17

The system of Claim 15, further including an oxygen saturation calculating circuit to determine blood oxygen saturation of the subject based on said calculated value of said first ratio constant.

Tien Claim 4

The system of Claim 1, further including an oxygen saturation calculating circuit to determine blood oxygen saturation of the subject based on said calculated value of said first ratio constant.

Reason for Interference

Pending Claim 17 and '105 patent Claim 4 would each anticipate or render obvious the other.

Pending Claim 18	Tien Claim 5	Reason for Interference
The system of Claim 15,	The system of Claim 1,	Pending Claim 18 and '105
further including a data table	further including a data table	patent Claim 5 would each
interrelating said calculated	interrelating said calculated	anticipate or render
value of said first ratio	value of said first ratio	obvious the other.
constant with blood oxygen	constant with blood oxygen	
saturation level.	saturation level.	

Pending Claim 19	Tien Claim 7	Reason for Interference
The system of Claim 15	The system of Claim 1	Pending Claim 19 and '105
wherein said first and second	wherein said first and second	patent Claim 7 would each
wavelengths are in the red and	wavelengths are in the red and	anticipate or render
infrared wavelength range,	near-infrared wavelength	obvious the other.
respectively.	range, respectively.	

Pending Claim 20	Tien Claim 8	Reason for Interference
The system of Claim 15	The system of Claim 1	Pending Claim 20 and '105
wherein said mathematical	wherein said mathematical	patent Claim 8 would each
relationship has the following	relationship has the following	anticipate or render
form:	form:	obvious the other.
$S_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$	$R^*(t) = \underline{\alpha R(t) - \alpha \beta r(t)}$	
and $s_1 = r_a s_2$	$\alpha - \beta$	
where S ₁ corresponds to said	* * * * * * * * * * * * * * * * * * * *	
first portion of said first	said first portion of said first	
generated signal, S _{red}	generated signal, R(t)	
corresponds to said first	corresponds to said first	
generated signal, including	generated signal, including	
said first and second portions	said first and second portions	
of said first generated signal,	of said first generated signal,	
S _{IR} corresponds to said second	r(t) corresponds to said	
generated signal, including	second generated signal,	
said first and second portions	including said first and second portions of said second	
of said second generated signal, ra is said first ratio	generated signal, α is said first	
constant and corresponds to a	ratio constant and corresponds	•
ratio of said first portion of	to a ratio of said first portion	
said first generated signal to	of said first generated signal	
said first portion of said	to said first portion of said	
second generated signal, and	second generated signal, and β	
r_v is a second ratio constant		
Ty 15 a 5000Ha Tatto Constant		

Mohamed K. Diab, et al.

•

September 1, 1998

and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal. corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.

Pending Claim 21

The system of Claim 15 wherein said mathematical relationship has the following form:

$$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$

where s₂ corresponds to said first portion of said second generated signal, S_{red} corresponds said to first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, ra is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.

Tien Claim 9

The system of Claim 1 wherein said mathematical relationship has the following form:

$$r^*(t) = \underline{R(t) - \beta r(t)}_{\alpha - \beta}$$

where r*(t) corresponds to said first portion of said second generated signal, R(t) corresponds to said first generated signal, including said first and second portions of said first generated signal, corresponds said r(t) to second generated signal, including said first and second portions of said second generated signal, a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and β is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to second portion of said second generated signal.

Reason for Interference

Pending Claim 21 and '105 patent Claim 9 would each anticipate or render obvious the other.

Pending Claim 22		
A method	for	the
enhancement of pl	ıysiolog	ical
signals for the m	easuren	nent
of blood oxygen in	n a subi	ect.

11011	Claim	10		
A	meth	od	for	the
enha	ncemer	nt of	physi	ological
signa	als for	the	meas	urement
of b	lood ox	ygen	in a	subject,

Tien Claim 10

Reason for Interference

The preamble recitation of each of pending Claim 22 and '105 patent Claim 10 is identical. Applicants take

the method comprising the steps of:	the method comprising the steps of:	no position as to whether this portion of the claims constitutes a limitation. To the extent the preamble recitation constitutes a limitation, each claim would anticipate the other as to the preamble recitation.
directing light from first and second light sources of different wavelengths toward the subject; detecting signals from said first and second light sources after interaction with the subject and generating first and second signals corresponding to an intensity of said first and second detected signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from light transmitted from said second source and a second portion arising from a second portion arising from a	directing light from first and second light sources of different wavelengths toward the subject; detecting signals from said first and second light sources after interaction with the subject and generating first and second signals corresponding to an intensity of said first and second detected signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising from a first interference source, said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from light transmitted from said second source and a second portion arising from a	Pending Claim 22 and '105 patent Claim 10 would each anticipate the other as to this limitation. Pending Claim 22 and '105 patent Claim 10 would each anticipate or render obvious the other as to this limitation.
coupling said first generated signal to a signal input of an adaptive signal processor having an adaptive filter having an input to receive a reference signal, and an output, and an error output generating an error signal wherein said error signal is coupled to said adaptive filter to adjust said adaptive filter	second interference light source; coupling said first generated signal to a signal input of an adaptive signal processor having an adaptive filter having an input to receive a reference signal, and an output, and an error output generating an error signal wherein said error signal is coupled to said adaptive filter to adjust said adaptive filter	Pending Claim 22 and '105 patent Claim 10 would each anticipate or render obvious the other as to this limitation.

so that a function of said error		
signal has a minimum;	signal has a minimum value;	
coupling an output signal	coupling an output signal	
from said adaptive signal	from said adaptive signal	patent Claim 10 would
processor to a peak detector	processor to a peak detector	each anticipate the other as
and calculating a first ratio	and calculating a first ratio	to this limitation.
value corresponding to a first	value corresponding to a first	
detected peak value of said	detected peak value of said	
error signal over a	error signal over a	
predetermined range of	predetermined range of	
possible ratio values;	possible ratio values;	
generating a first reference	generating a first reference	Pending Claim 22 and '105
signal based on a	signal based on a	patent Claim 10 would
mathematical relationship of	mathematical relationship of	_
said first and second portions	said first and second portions	to this limitation.
of said first and second		
generated signals, and said	generated signals, and said	
first ratio value; and	first ratio value; and	
coupling said first reference	coupling said first reference	_
signal to said adaptive filter	signal to said adaptive filter	-
input wherein said filter	input wherein said filter	-
output generates an estimate	output generates an estimate	to this limitation.
of said first portion of said	of said first portion of said	·
first generated signal.	first generated signal.	

Pending Claim 23	Tien Claim 11	Reason for Interference
The method of Claim 22	The method of Claim 10	Pending Claim 23 and '105
wherein said output signal	wherein said output signal	patent Claim 11 would
from said adaptive signal	from said adaptive signal	each anticipate or render
processor is said error signal	processor is said error signal	obvious the other.
and said calculated first ratio	and said calculated first ratio	
value is based on said first	value is based on said first	
detected peak value in said	detected peak value in said	
error signal.	error signal.	

Pending Claim 24	Tien Claim 12	Reason for Interference
The method of Claim 22	The method of Claim 10	Pending Claim 24 and '105
wherein said output signal	wherein said output signal	patent Claim 12 would
from said adaptive signal	from said adaptive signal	each anticipate or render
processor is derived from said	processor is derived from said	obvious the other.
adaptive filter output and said	adaptive filter output and said	
calculated first ratio value is	calculated first ratio value is	
based on said first detected	based on said first detected	
peak value in said output	peak value in said output	•

signal	derived	from	said	signal	derived	from	said	
adaptiv	e filter out	put.		adaptiv	e filter out	put.		

Pending Claim 25	Tien Claim 14	Reason for Interference
The method of Claim 24,	The method of Claim 12,	Pending Claim 25 and '105
further including the step of	further including the step of	patent Claim 14 would
generating an approximation	generating said first portion of	each anticipate or render
to said first portion of said	said second generated signal	obvious the other.
second generated signal based	based on said mathematical	-
on said mathematical	relationship and said	
relationship and said	calculated first ratio value.	
calculated first ratio value.		

Pending Claim 26	Tien Claim 15	Reason for Interference
The method of Claim 25	The method of Claim 14	Pending Claim 26 and '105
wherein said first ratio value	wherein said first ratio value	patent Claim 15 would
is a ratio of said first portion	is a ratio of said first portion	each anticipate or render
of said first generated signal	of said first generated signal	obvious the other.
to said first portion of said	to said first portion of said	
second generated signal.	second generated signal.	

Pending Claim 27	Tien Claim 17	Reason for Interference
The method of Claim 22,	The method of Claim 10,	Pending Claim 27 and '105
further including the step of	further including the step of	patent Claim 17 would
determining a blood oxygen	determining a blood oxygen	each anticipate or render
saturation level of the subject	saturation level of the subject	obvious the other.
based on said calculated first	based on said calculated first	
ratio value.	ratio value.	

Pending Claim 28	Tien Claim 18	Reason for Interference
The method of Claim 22,	The method of Claim 10,	Pending Claim 28 and '105
further including the step of	further including the step of	patent Claim 18 would
determining a blood oxygen	determining a blood oxygen	each anticipate or render
saturation level of the subject	saturation level of the subject	obvious the other.
using a data table interrelating	using a data table interrelating	
said calculated first ratio	said calculated first ratio	
value with blood oxygen	value with blood oxygen	
saturation level.	saturation level.	

Pending Claim 29	Tien Claim 19	Reason for Interference
The method of Claim 22	The method of Claim 10	Pending Claim 29 and '105
wherein said mathematical	wherein said mathematical	patent Claim 19 would

Mohamed K. Diab, et al.

Filed

September 1, 1998

relationship has the following form:

$$s_2 = (S_{red} - r_v S_{1R})/(r_a - r_v)$$
 and $s_1 = r_a s_2$

where S₁ corresponds to said first portion of said first generated signal. S_{red} said corresponds to first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, ra is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal.

relationship has the following form:

$$R^*(t) = \frac{\alpha R(t) - \alpha \beta r(t)}{\alpha - \beta}$$

where R*(t) corresponds to said first portion of said first generated signal, R(t) corresponds to said first generated signal, including said first and second portions of said first generated signal, said r(t) corresponds to second generated signal, including said first and second portions of said second generated signal, a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and β is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to second portion of said second generated signal.

each anticipate or render obvious the other.

Pending Claim 30

The method of Claim 22 wherein said mathematical relationship has the following form:

$$S_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$

where S₂ corresponds to said first portion of said second generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including

Tien Claim 20

The method of Claim 10 wherein said mathematical relationship has the following form:

$$r^*(t) = \frac{R(t) - \beta r(t)}{\alpha - \beta}$$

where r*(t) corresponds to said first portion of said second generated signal, R(t) corresponds to said first generated signal, including said first and second portions of said first generated signal, r(t) corresponds to said second generated signal,

Reason for Interference

Pending Claim 30 and '105 patent Claim 20 would each anticipate or render obvious the other.

Mohamed K. Diab, et al.

Filed

September 1, 1998

said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second portion of said second portion of said second generated signal.

including said first and second portions of said second generated signal, a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and β is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to second portion of said second generated signal.

(4) Applicants Will Prevail on Priority -- 37 CFR § 41.202(a)(4)

Applicants will prevail on priority in an interference, if declared. Applicants would be the Senior Party in an interference. In particular, the '105 patent lists an earliest priority date of May 17, 1995. Applicants are entitled to constructively claim priority to, *inter alia*, U.S. Application No. 08/132,812, filed October 6, 1993. Accordingly, the Applicants can prove a constructive reduction to practice earlier than the earliest constructive reduction to practice of the '105 patent. Moreover, Applicants are able to prove a date of invention prior to constructive reduction to practice. For at least these reasons, Applicants will prevail on priority if an interference is declared.

(5) Written Description/Constructive Reduction to Practice -- 37 CFR § 41.202(a)(5),(6)

The following tables illustrate the written description support for Claims 15-30 in the pending application and priority applications¹.

Claim 15

A system for the enhancement of physiological	09/144,897 (September 1, 1998)
signals for the measurement of blood oxygen in a	p. 6, 11. 4-9;
subject, the system comprising:	p. 6, l. 25 – p. 7, l. 13;
	p. 63, 1. 33 – p. 64. l. 12;

The cited references are not exhaustive. In the event interference is declared, Applicants reserve the right to set forth additional citations or rely on one or more applications not cited herein.

Mohamed K. Diab, et al. September 1, 1998 :

:

	· ·
	08/859,837 (May 16, 1997) p. 6, 1l. 4-9; p. 6, 1. 25 – p. 7, 1. 13; p. 63, 1.33 – p. 64. l. 12;
	08/320,154 (October 7, 1994) p. 6, ll. 4-9; p. 6, l. 25 – p. 7, l. 13; p. 63, l. 33 – p. 64. l. 12;
	08/132,812 (October 6, 1993) p. 7, ll. 27-31; p. 8, l. 18 – p. 9, l. 8; p. 78, l. 4 - p. 78, l. 20;
first and second light sources to direct light toward the subject, said first and second light sources producing first and second light signals of first and second wavelengths, respectively;	09/144,897 (September 1, 1998) p. 8, ll. 1-4;
	08/859,837 (May 16, 1997) p. 8, ll. 1-4; p. 64, l. 28 – p. 65, l. 1; p. 65, ll. 18-24; p. 67, ll. 25-27;
	08/320,154 (October 7, 1994) p. 8, ll. 1-4; p. 64, l. 28 – p. 65, l. 1; p. 65, ll. 18-24; p. 67, ll. 25-27;
	08/132,812 (October 6, 1993) p. 9, ll. 28-31; p. 79, ll. 5-14; p. 79, l. 31- p. 80, l. 1; p. 81, ll. 3-5.
a light detector positioned to detect said first and second light signals after interaction with the subject and to generate first and second signals indicative of an intensity of said first and second detected light signals, respectively, said first generated signal having a first portion arising from light transmitted from said first source and a second portion arising	09/144,897 (September 1, 1998) p. 7, l. 13 - 8, l. 14; p. 18, ll. 8-29; Figures 4a-4b; p. 64, ll. 28-33; p. 65, ll. 20-28; p. 67, ll. 25-36;

Mohamed K. Diab, et al.

September 1, 1998

from a first interference source; said second generated signal having a first portion arising from light transmitted from said second source and a second portion arising from a second interference source;

```
p. 114, ll. 3-16;
Figures 26, 27.
```

08/859,837 (May 16, 1997)

p. 7, 1. 13 - 8, 1. 14;

p. 8, 1. 1-14;

p. 18, 11. 8-29;

Figures 4a-4b;

p. 64, 11. 28-33;

p. 65, 11. 20-28;

p. 67, 11. 25-36;

p. 114, ll. 3-16;

Figures 26, 27.

08/320,154 (October 7, 1994)

p. 7, 1. 13 - 8, 1. 14;

p. 8, 1. 1-14;

p. 18, ll. 8-29;

Figures 4a-4b;

p. 64, 11. 28-33;

p. 65, 11. 20-28;

p. 67, ll. 25-36;

p. 114, ll. 3-16;

Figures 26,27.

08/132,812 (October 6, 1993)

p. 9, 1. 1 - 10, 1. 7;

p. 28, 1.25 - p.29, 1.12;

Figures 4a-4b;

p. 79, ll. 5-10;

p. 79, 1. 31 - p. 80 1. 12;

p. 81, ll. 3-23;

p. 91, ll. 1-14;

Figures 26, 27.

09/144,897 (September 1, 1998)

p. 17, Il. 10-21;

p. 18, ll. 6-10;

Figures 4a-b;

p. 19, l. 19 – p. 21, l. 22;

Figures 5a-b;

p. 37, l. 4 - p. 38, l. 24;

p. 65, 11. 27-32;

Figure 11.

08/859,837 (May 16, 1997)

an adaptive signal processor having a signal input coupled to said light detector to receive said first generated signal, an adaptive filter having an input to receive a reference signal, and an output, and an error output to generate an error signal, wherein said error output is coupled to said adaptive filter to adjust said adaptive filter so that a function of said error signal has a minimum;

Mohamed K. Diab, et al.

September 1, 1998

p. 17, ll. 10-21; p. 18, ll. 6-10; Figures 4a-b; p. 19, 1.19 - p.21, 1.22;Figures 5a-b; p. 37, 1. 4 - p. 38, 1. 24; p. 65, ll. 27-32; Figure 11. 08/320,154 (October 7, 1994) p. 17, ll. 10-21; p. 18, ll. 6-10; Figures 4a-b; p. 19, l. 19 – p. 21, l. 22; Figures 5a-b; p. 37, l. 4 - p. 38, l. 24; p. 65, ll. 27-32; Figure 11. 08/132,812 (October 6, 1993) p. 27, 1. 30 - p. 28, 1. 9; p. 28, ll. 22-26; Figures 4a-b; p. 30, 1. 5 - p. 32, 1. 18; Figures 5a-b; p. 52, 1.19 - 53, 1.30p. 80, 11. 4 - 27; Figure 11. 09/144,897 (September 1, 1998) wherein said first and second portions of said first p. 16, l. 25 - p. 17, l. 8; and second generated signals and a first ratio p. 18, l. 8 - p. 19, l. 9; constant have a defined mathematical relationship; Figures 4a-4b; p.23, 11. 9-29 and, in particular, Equations 5a, 5b; p. 120, ll. 23-30. 08/859,837 (May 16, 1997)

p. 16, l. 25 – p. 17, l. 8;

p. 18, l. 8 - p. 19, l. 9;

Figures 4a-4b;

p.23, 11. 9-29 and, in particular, Equations 5a, 5b;

p. 120, ll. 23-30.

08/320,154 (October 7, 1994)

Mohamed K. Diab, et al.

September 1, 1998

Figures 4:
p.23, ll. 9
Equati
p. 120, ll.

08/132,81
p. 28, l. 2

p. 18, l. 8 – p. 19, l. 9;
Figures 4a-4b;
p.23, ll. 9-29 and , in particular,
Equations 5a, 5b;
p. 120, ll. 23-30.

p. 16, 1.25 - p. 17, 1.8;

08/132,812 (October 6, 1993)

p. 28, l. 25 - p. 29, l. 28;
Figures 4a, 4b;
p. 34, l. 22 - p. 35, l. 8 and, in particular, Equations 5a, 5b;
p. 107, ll. 14-22.

a reference signal generator to generate said reference signal based on a possible value of said first ratio constant; and

09/144,897 (September 1, 1998)

p. 18, l. 30 – p. 19, l. 14; figures 4a, 4b; p. 36, l. 29 – p. 37, l. 31; p. 120, ll. 23-30.

08/859,837 (May 16, 1997)

p. 18, l. 30 – p. 19, l. 14; figures 4a, 4b; p. 36, l. 29 – p. 37, l. 31; p. 120, ll. 23-30.

08/320,154 (October 7, 1994)

p. 18, l. 30 – p. 19, l. 14; figures 4a, 4b; p. 36, l. 29 – p. 37, l. 31; p. 120, ll. 23-30.

08/132,812 (October 6, 1993)

p. 43, ll. 4-24 Figures 4a, 4b; p. 52, l. 9 – p. 53, l. 6; p. 107, ll. 14-22

a peak detector to receive an output signal from said adaptive signal processor and determine a calculated value for said first ratio constant corresponding to a first peak value of said output signal over a predetermined range of possible ratios, said reference signal generator generating said first portion of said first detected signal and said first portion of said second detected signal based on said mathematical relationship and said calculated value

09/144,897 (September 1, 1998) p. 22, l. 24 – p. 23, l. 29, and in

particular, Equation 5b; p. 37, 1. 32 – p. 38, 1. 24; Figures 7a-c;

p. 80, l. 36 – p. 81, l. 26; Figure 18.

08/859,837 (May 16, 1997)

: Mohamed K. Diab, et al.

Filed

September 1, 1998

of said first ratio constant.

p. 22, 1. 24 – p. 23, 1. 29, and in particular, Equation 5b;

p. 37, l. 32 – p. 38, l. 24;

Figures 7a-c;

p. 80, l. 36 – p. 81, l. 26;

Figure 18.

08/320,154 (October 7, 1994)

p. 22, 1. 24 – p. 23, 1. 29, and in particular, Equation 5b;

p. 37, l. 32 – p. 38, l. 24;

Figures 7a-c;

p. 80, 1. 36 – p. 81, 1. 26;

Figure 18.

08/132,812 (October 6, 1993)

p. 33, 1. 32 – p. 35, 1. 8, and in particular, Equation 5b;

p. 53, 11. 7-30;

Figures 7a-c.

Claim 16

The system of Claim 15 wherein said output signal received by said peak detector is selected from a set of output signals comprising approximations to said first and second signal portions of said first and second signals, wherein said error output and said adaptive filter output generate output signals of said set.

09/144,897 (September 1, 1998)

p. 20, l. 29 – p. 21, l. 15;

Figures 5a-b.

08/859,837 (May 16, 1997)

p. 20, l. 29 – p. 21, l. 15;

Figures 5a-b.

08/320,154 (October 7, 1994)

p. 20, l. 29 – p. 21, l. 15;

Figures 5a-b.

08/132,812 (October 6, 1993)

p. 31, 1.21 - p. 32, 1.10;

Figures 5a-b.

Claim 17

The system of Claim 15, further including an oxygen saturation calculating circuit to determine blood oxygen saturation of the subject based on said calculated value of said first ratio constant.

09/144,897 (September 1, 1998)

p. 62, l. 17 - p. 63, l. 31;

p. 117, ll. 6 - 18;

p. 86, l. 6 – p. 89, l. 16;

Mohamed K. Diab, et al.

Filed

September 1, 1998

Figure 19;

p. 79, ll. 12-15;

Figure 17;

p. 81, 11. 19-26;

Figure 18.

08/859,837 (May 16, 1997)

p. 62, l. 17 - p. 63, l. 31;

p. 117, ll. 6 - 18;

p. 86, 1. 6 – p. 89, 1. 16;

Figure 19;

p. 79, 11. 12-15;

Figure 17;

p. 81, ll. 19-26;

Figure 18.

08/320,154 (October 7, 1994)

p. 62, l. 17 - p. 63, l. 31;

p. 117, ll. 6 - 18;

p. 86, l. 6 – p. 89, l. 16;

Figure 19;

p. 79, ll. 12-15;

Figure 17;

p. 81, ll. 19-26;

Figure 18.

08/132,812 (October 6, 1993)

p. 96, 11. 10-18;

p. 101, l. 35 - p. 102, l. 19;

p. 76, 1. 32 - p. 77, 1. 35.

Claim 18

The system of Claim 15, further including a data table interrelating said calculated value of said first ratio constant with blood oxygen saturation level.

09/144,897 (September 1, 1998)

p. 86, l. 6 – p. 89, l. 16;

Figure 19;

p. 79, ll. 12-15;

Figure 17;

p. 81, ll. 19-26;

Figure 18.

08/859,837 (May 16, 1997)

p. 86, l. 6 - p. 89, l. 16;

Figure 19;

p. 79, ll. 12-15;

Figure 17;

Mohamed K. Diab, et al.

Filed

September 1, 1998

p. 81, ll. 19-26; Figure 18.

08/320,154 (October 7, 1994)

p. 86, 1.6 - p. 89, 1.16;

Figure 19;

p. 79, ll. 12-15;

Figure 17;

p. 81, ll. 19-26;

Figure 18.

Claim 19

The system of Claim 15 wherein said first and second wavelengths are in the red and infrared wavelength range, respectively.

09/144,897 (September 1, 1998)

p. 22, 11. 3-15;

p. 42, l. 17;

p. 65, ll. 20-24;

p. 79, 11. 8-12;

p. 116, ll. 10-13.

08/859,837 (May 16, 1997)

p. 22, ll. 3-15;

p. 42, l. 17;

p. 65, 11. 20-24;

p. 79, 11. 8-12;

p. 116, ll. 10-13.

08/320,154 (October 7, 1994)

p. 22, 11. 3-15;

p. 42, l. 17;

p. 65, 11. 20-24;

p. 79, ll. 8-12;

p. 116, ll. 10-13.

08/132,812 (October 6, 1993)

p. 33, 11. 8-20;

p. 57, l. 16;

p. 79, 1.32 - p.80, 1.12.

Mohamed K. Diab, et al.

Filed

September 1, 1998

Claim 20

The system of Claim 15 wherein said mathematical relationship has the following form:

$$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$
 and $s_1 = r_a s_2$

where s_l corresponds to said first portion of said first generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal to said second portion of said second generated signal.

09/144,897 (September 1, 1998)

p. 15, 11, 29-36;

p. 16, 1.25 - p.17, 1.6;

p. 98, 1. 22 – p. 99, 1. 2;

p. 99, l. 24 - p. 100, l. 4.

08/859,837 (May 16, 1997)

p. 15, ll. 29-36;

p. 16, l. 25 – p. 17, l. 6;

p. 98, l. 22 - p. 99, l. 2;

p. 99, l. 24 – p. 100, l. 4.

08/320,154 (October 7, 1994)

p. 15, ll. 29-36;

p. 16, 1.25 - p.17, 1.6;

p. 98, 1. 22 - p. 99, 1. 2;

p. 99, l. 24 - p. 100, l. 4.

Mohamed K. Diab, et al.

Filed

September 1, 1998

Claim 21

The system of Claim 15 wherein said mathematical relationship has the following form:

$$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$

where s₂ corresponds to said first portion of said second generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal to said second portion of said second generated signal.

09/144,897 (September 1, 1998)

- p. 15, ll. 29-36;
- p. 16, l. 25-p. 17, l. 6;
- p. 98, 1. 22 p. 99, 1. 2;
- p. 99, 1. 24 p. 100, 11. 1-4.

08/859,837 (May 16, 1997)

- p. 15, ll. 29-36;
- p. 16, l. 25-p. 17, l. 6;
- p. 98, 1. 22 p. 99, 1. 2;
- p. 99, l. 24 p. 100, ll. 1-4.

08/320,154 (October 7, 1994)

- p. 15, ll. 29-36;
- p. 16, l. 25-p. 17, l. 6;
- p. 98, l. 22 p. 99, l. 2;
- p. 99, 1. 24 p. 100, ll. 1-4.

Claim 22

A method for the enhancement of physiological signals for the measurement of blood oxygen in a subject

09/144,897 (September 1, 1998)

- p. 6, 11. 4-9;
- p. 6, 1. 25 p. 7, 1. 13;
- p. 63, l. 33 p. 64, l. 12.

08/859,837 (May 16, 1997)

- p. 6, ll. 4-9;
- p. 6, 1. 25 p. 7, 1. 13;
- p. 63, l. 33 p. 64, l. 12.

08/320,154 (October 7, 1994)

p. 6, ll. 4-9;

Mohamed K. Diab, et al.

September 1, 1998

Figure 4a-4b; p. 64, 11. 28-33; p. 65, 11. 20-28; p. 67, 11. 25-36; p. 114, ll. 3-16; Figure 26, 27. 08/320,154 (October 7, 1994) p. 7, 11. 13-36; p. 8, 11. 1-14; p. 18, ll. 8-29; Figure 4a-4b; p. 64, 11. 28-33; p. 65, ll. 20-28; p. 67, 11. 25-36; p. 114, ll. 3-16; Figure 26, 27. 08/132,812 (October 6, 1993) p. 9, l. 8 - p. 10, l. 26; p. 28, 1.25 - p.29, 1.12; Figures 4a-4b; p. 79, 11. 5-10; p. 79, l. 31 - p. 80, l. 6; p. 94, 11. 9-19; Figures 24, 25. coupling said first generated signal to a signal input 09/144,897 (September 1, 1998) of an adaptive signal processor having an adaptive p. 17, Il. 10-21; filter having an input to receive a reference signal, p. 18, ll. 6-10; and an output, and an error output generating an Figures 4a-b; error signal wherein said error signal is coupled to p. 19, l. 19 - p. 21, l. 15; said adaptive filter to adjust said adaptive filter so Figures 5a-b; that a function of said error signal has a minimum; p. 37, l. 4 - p. 38, l. 24; p. 65, ll. 27-32; Figure 11. 08/859,837 (May 16, 1997) p. 17, ll. 10-21; p. 18, ll. 6-10; Figures 4a-b; p. 19, l. 19 – p. 21, l. 15; Figures 5a-b;

p. 37, 1.4 - p. 38, 1.24;

p. 65, ll. 27-32; Figure 11.

Mohamed K. Diab, et al.

September 1, 1998

08/320,154 (October 7, 1994)

p. 17, ll. 10-21; p. 18, ll. 6-10; Figures 4a-b;

p. 19, 1. 19 – p. 21, 1. 15;

Figures 5a-b;

p. 37, l. 4 – p. 38, l. 24;

p. 65, ll. 27-32; Figure 11.

08/132,812 (October 6, 1993)

p. 27, 1. 30 – p. 28, 1. 9;

p. 28, 11. 22-28

Figures 4a-b;

p. 30, l. 5 - p. 32, l. 30;

Figures 5a-b;

p. 53, 11. 7-30;

p. 79, 1. 30 - p. 80, 1.

Figure 11.

coupling an output signal from said adaptive signal processor to a peak detector and calculating a first ratio value corresponding to a first detected peak value of said error signal over a predetermined range of possible ratio values; 09/144,897 (September 1, 1998)

p. 36, l. 29 – p. 37, l. 31;

p. 37, l. 32 – p. 38, l. 24;

Figures 7a-c;

p. 80, l. 36 – p. 81, l. 26;

Figure 18.

08/859,837 (May 16, 1997)

p. 36, l. 29 – p. 37, l. 31;

p. 37, 1. 32 - p. 38, 1. 24;

Figures 7a-c;

p. 80, l. 36 – p. 81, l. 26;

Figure 18.

08/320,154 (October 7, 1994)

p. 36, l. 29 – p. 37, l. 31;

p. 37, l. 32 – p. 38, l. 24;

Figures 7a-c;

p. 80, 1. 36 – p. 81, 1. 26;

Figure 18.

08/132,812 (October 6, 1993)

p. 52, l. 9 – p. 53, l. 30;

Figures 7a-c;

: Mohamed K. Diab, et al.

Filed

: September 1, 1998

generating a first reference signal based on a mathematical relationship of said first and second portions of said first and second generated signals, and said first ratio value; and

09/144,897 (September 1, 1998)

p. 16, 1.25 - p. 17, 1.8;

p. 18, l. 8 - p. 19, l. 14;

Figures 4a-4b;

p. 23, 11. 9-29 and, in particular, Equations 5a, 5b;

p. 120, 11. 23-30.

08/859,837 (May 16, 1997)

p. 16, 1.25 - p.17, 1.8;

p. 18, l. 8 – p. 19, l. 14;

Figures 4a-4b;

p. 23, 11. 9-29 and, in particular,

Equations 5a, 5b;

p. 120, ll. 23-30.

08/320,154 (October 7, 1994)

p. 16, 1. 25 – p. 17, 1. 8;

p. 18, l. 8 – p. 19, l. 14;

Figures 4a-4b;

p. 23, ll. 9-29 and, in particular,

Equations 5a, 5b;

p. 120, 1l. 23-30.

08/132,812 (October 6, 1993)

p. 27, 11. 28-32;

p. 28, 1. 25 - p.29, 1. 33;

Figures 4a-4b;

p. 34, 1. 22 – p. 35, 1. 8 and, in

particular, Equations 5a,5b;

p. 107, ll. 14-22

coupling said first reference signal to said adaptive filter input wherein said filter output generates an estimate of said first portion of said first generated signal.

09/144,897 (September 1, 1998)

p. 20, 1. 29 – p. 21, 1. 15;

Figure 5b;

p. 22, 1.24 - p.23, 1.29;

08/859,837 (May 16, 1997)

p. 20, 1.29 - p.21, 1.15;

Figure 5b;

p. 22, 1. 24 - p. 23, 1. 29;

08/320,154 (October 7, 1994)

p. 20, 1.29 - p.21, 1.15;

Figure 5b;

p. 22, 1. 24 – p. 23, 1. 29;

: Mohamed K. Diab, et al.

Filed :

September 1, 1998

08/132,812 (October 6, 1993) p. 31, 1. 21 – p. 32, 1. 10; Figure 5b; p. 33, 1. 32 – p. 35, 1. 8

Claim 23

The method of Claim 22 wherein said output signal from said adaptive signal processor is said error signal and said calculated first ratio value is based on said first detected peak value in said error signal.

09/144,897 (September 1, 1998)

p. 20, l. 29 – p. 21, l. 15; Figures 5a-b; p. 37, l. 32 – p. 38, l. 24; Figures 7a-c; p. 80, l. 36 – p. 81, l. 26; Figure 18.

08/859,837 (May 16, 1997)

p. 20, l. 29 - p. 21, l. 15; Figures 5a-b; p. 37, l. 32 - p. 38, l. 24; Figures 7a-c; p. 80, l. 36 - p. 81, l. 26; Figure 18.

08/320,154 (October 7, 1994)

p. 20, l. 29 – p. 21, l. 15; Figures 5a-b; p. 37, l. 32 – p. 38, l. 24; Figures 7a-c; p. 80, l. 36 – p. 81, l. 26; Figure 18.

08/132,812 (October 6, 1993)

p. 31, l. 21 – p. 32, l. 10; Figures 5a-5b; p. 53, ll. 6-30; Figures 7a-c;

Claim 24

The method of Claim 22 wherein said output signal from said adaptive signal processor is derived from said adaptive filter output and said calculated first ratio value is based on said first detected peak value in said output signal derived from said adaptive filter

09/144,897 (September 1, 1998)

p. 20, l. 29 – p. 21, l. 15; Figures 5a-b; p. 37, l. 32 – p. 38, l. 24; Figures 7a-c;

Mohamed K. Diab, et al.

September 1, 1998

output.

p. 80, l. 36 – p. 81, l. 26;

Figure 18.

08/859,837 (May 16, 1997)

p. 20, 1. 29 – p. 21, 1. 15;

Figures 5a-b;

p. 37, l. 32 – p. 38, l. 24;

Figures 7a-c;

p. 80, l. 36 – p. 81, l. 26;

Figure 18.

08/320,154 (October 7, 1994)

p. 20, l. 29 – p. 21, l. 15;

Figures 5a-b;

p. 37, l. 32 - p. 38, l. 24;

Figures 7a-c;

p. 80, 1. 36 – p. 81, 1. 26;

Figure 18.

08/132,812 (October 6, 1993)

p. 31, l. 21 - p. 32, l. 10;

Figures 5a-b;

p. 53, ll. 6-30;

Figures 7a-c;

Claim 25

The method of Claim 24, further including the step of generating an approximation to said first portion of said second generated signal based on said mathematical relationship and said calculated first ratio value.

09/144,897 (September 1, 1998)

p. 21, ll. 2-8;

Figure 5a;

p. 22, l. 3 - p. 23, l. 18

08/859,837 (May 16, 1997)

p. 21, ll. 2-8;

Figure 5a;

p. 22, l. 3 - p. 23, l. 18

08/320,154 (October 7, 1994)

p. 21, ll. 2-8;

Figure 5a;

p. 22, l. 3 – p. 23, l. 18

08/132,812 (October 6, 1993)

p. 31, l. 30 - p. 32, l. 3;

Figure 5a;

p. 33, l. 8 - p. 34, l. 32.

Mohamed K. Diab, et al.

Filed: September 1, 1998

Claim 26

The method of Claim 25 wherein said first ratio value is a ratio of said first portion of said first generated signal to said first portion of said second generated signal.

09/144,897 (September 1, 1998)

p. 22, l. 3 – p. 23, l. 29, and, in particular, Equation 3;
p. 120, ll. 23-30.

08/859,837 (May 16, 1997)

p. 22, l. 3 – p. 23, l. 29, and, in particular, Equation 3;
p. 120, ll. 23-30.

08/320,154 (October 7, 1994)

p. 22, l. 3 – p. 23, l. 29, and, in particular, Equation 3;p. 120, ll. 23-30.

08/132,812 (October 6, 1993)

p. 33, l. 8 – p. 34, l. 32, and in particular Equation 3;
p. 107, ll. 14-22.

Claim 27

The method of Claim 22, further including the step of determining a blood oxygen saturation level of the subject based on said calculated first ratio value.

09/144,897 (September 1, 1998)

- p. 79, 11. 12-15;
- p. 117, ll. 6-18;
- p. 62, l. 17 p. 63, l. 31;
- Figure 17;
- p. 81, Il. 19-26;
- Figure 18;
- p. 86, l. 6 p. 89, l. 16;
- Figure 19.

08/859,837 (May 16, 1997)

- p. 79, ll. 12-15;
- p. 117, ll. 6-18;
- p. 79, 11. 12-15;
- Figure 17;
- p. 81, ll. 19-26;
- Figure 18;
- p. 86, 1.6 p. 89, 1.16;
- Figure 19.

: Mohamed K. Diab, et al.

Filed:

September 1, 1998

08/320,154 (October 7, 1994)

p. 79, 11. 12-15;

p. 117, ll. 6-18;

p. 79, 11. 12-15;

Figure 17;

p. 81, ll. 19-26;

Figure 18;

p. 86, 1.6 - p. 89, 1.16;

Figure 19.

08/132,812 (October 6, 1993)

p. 96, ll. 10-18;

p. 101, l. 35 - p. 102, l. 19;

p. 76, l. 32 - p. 77, l. 35.

Claim 28

The method of Claim 22, further including the step of determining a blood oxygen saturation level of the subject using a data table interrelating said calculated first ratio value with blood oxygen saturation level.

09/144,897 (September 1, 1998)

p. 86, l. 6 – p. 89, l. 16;

figure 19;

p. 79, ll. 12-15;

Figure 17;

p. 81, 11. 19-26;

Figure 18.

08/859,837 (May 16, 1997)

p. 86, l. 6 – p. 89, l. 16;

figure 19;

p. 79, ll. 12-15;

Figure 17;

p. 81, 11. 19-26;

Figure 18.

08/320,154 (October 7, 1994)

p. 86, l. 6 – p. 89, l. 16;

figure 19;

p. 79, 11. 12-15;

Figure 17;

p. 81, ll. 19-26;

Figure 18.

Claim 29

Mohamed K. Diab, et al.

Filed :

September 1, 1998

The method of Claim 22 wherein said mathematical relationship has the following form:

$$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$
 and $s_1 = r_a s_2$

where s_l corresponds to said first portion of said first generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal to said second portion of said second generated signal.

09/144,897 (September 1, 1998)

p. 15, 11. 29-36;

p. 16, 1.25 - p. 17, 1.6;

p. 98, 1. 22 – p. 99, 1. 2;

p. 99, l. 24 - p. 100, l. 4

08/859,837 (May 16, 1997)

p. 15, 11. 29-36;

p. 16, l. 25 – p. 17, l. 6;

p. 98, 1. 22 – p. 99, 1. 2;

p. 99, l. 24 – p. 100, l. 4

08/320,154 (October 7, 1994)

p. 15, ll. 29-36;

p. 16, 1.25 - p. 17, 1.6;

p. 98, 1. 22 – p. 99, 1. 2;

p. 99, 1. 24 – p. 100, 1. 4

Claim 30

The method of Claim 22 wherein said mathematical relationship has the following form:

$$s_2 = (S_{red} - r_v S_{IR})/(r_a - r_v)$$

where S_2 corresponds to said first portion of said second generated signal, S_{red} corresponds to said first generated signal, including said first and second portions of said first generated signal, S_{IR} corresponds to said second generated signal, including said first and second portions of said second generated signal, r_a is said first ratio constant and corresponds to a ratio of said first portion of said first generated signal to said first portion of said second generated signal, and r_v is a second ratio constant and corresponds to a ratio of said second portion of said first generated signal to said second portion of said second generated signal to said second portion of said second generated signal.

09/144,897 (September 1, 1998)

p. 15, 1l. 29-36;

p. 16, 1.25 - p. 17, 1.6;

p. 98, 1.22 - p.99, 1.2;

p. 99, 1. 24 - p. 100, 11. 4

08/859,837 (May 16, 1997)

p. 15, 11. 29-36;

p. 16, 1.25 - p. 17, 1.6;

p. 98, 1. 22 - p. 99, 1. 2;

p. 99, l. 24 - p. 100, ll. 4

08/320,154 (October 7, 1994)

p. 15, 11. 29-36;

p. 16, l. 25 – p. 17, l. 6;

p. 98, 1.22 - p.99, 1.2;

p. 99, 1. 24 – p. 100, 1l. 4

: Mohamed K. Diab, et al.

Filed

September 1, 1998

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated:

February 21, 2006

John M. Grover

Registration No. 42,610 Attorney of Record Customer No. 20,995 (949) 760-0404

2335185:blw 013006